TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE (Read instructions on the reverse side prior to initiating this form)	DATE	TRANSMITTAL NO.
	10/16/2007	01450-143.1

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO:	FROM:	CONTRACT NO.	CHECK ONE:
Environmental Residency US Army Corps of Engineers 214 State Highway 18 East Brunswick, NJ 08816	Sevenson Environmental Services Inc. 2749 Lockport Road Niagara Falls, NY 14305	W912DQ-04-D-0023 0007	[X] THIS IS A NEW TRANSMITTAL [ ] THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (Cover only one section with each transmittal)	PROJECT TITLE AND LOCATION	CHECK ONE: THIS TRANSMITTAL IS
01450	Cornell-Dubilier Electronics OU-2 Demo 333 Hamilton Boulevard, SP, NJ 07080	FOR [X] FIO [ ] GA [ ] DA [ ] CR

ITEM NO. a.	DESCRIPTION OF ITEM SUBMITTED (Type size, model number/etc.) b.	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. (See instruction no. 8) c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT SPEC. PARA NO. e.	CONTRACT REFERENCE DOCUMENT DRAWING SHEET NO. f.	FOR CONTRACTOR USE CODE g.	VARIATION (See Instruction No. 6) h.	FOR CE USE CODE i.
23	SAP Plan - Addendum 1 -CDA Area Rev 2	WORK PLAN	6	1.4		A	N	

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in the strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by item No.)	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

SAP Plan

(CDA Area)

Addendum 1

Cornell - Dubilier Electronics Superfund Site
Middlesex County, New Jersey

Prepared For:

U.S. Army Corps of Engineers

USACE Contract Number - W912DQ-04-D-0023
Task Order - 0007
Operating Unit 2
(clusters 1-11 and 13)

Prepared By:

Sevenson Environmental Services, Inc.
2749 Lockport Road
Niagara Falls, New York 14305

October 16, 2007

Rev. 2

Addendum 1

Sampling and Analysis Plan

Operable Unit 2 – Building Demolition
Cornell-Dubilier Electronics Superfund Site
South Plainfield, New Jersey

Original Submittal: August 2007
Revision 1: September 2007
Revision 2: October 2007

Sampling and Analysis Plan (SAP) Addendum 1 has been prepared by Sevenson Environmental Services, Inc. (Sevenson) to address sampling related to the Capacitor Disposal Area (CDA) located at the Cornell-Dubilier Electronics Superfund Site (site), located in South Plainfield, New Jersey. This document serves as an addendum to the previously approved site SAP, specifically, Field Sampling Plan (FSP) Revision 3, dated January 18, 2007, and Quality Assurance Project Plan (QAPP) Revision 2, dated April 17, 2007. As such, the complete SAP should be referenced for elements not included in this addendum. This Plan will document the means and methods used to collect waste characterization samples during excavation of the CDA per the requirements of the offsite disposal facility and to verify that the complete extent of contamination has been removed prior to site restoration.

1.0 Scope and Objectives

Data quality objectives (DQOs) for this phase of work are included in Attachment 1.

In-situ soil samples will be collected from the CDA for waste characterization and disposal facility approval. Samples for metals, volatile organic compound (VOC), semi-volatile organic compound (SVOC), pesticide, and herbicide analyses will undergo toxicity characteristic leachate procedure (TCLP) extractions prior to laboratory analysis. Samples for polychlorinated biphenyl (PCB) analysis will be analyzed for total PCBs. Samples will also be analyzed for dioxins and dibenzofurans. Waste characterization samples will be compared against the 40CFR261 *Characteristics for Hazardous Waste* and 40CFR761 *PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions* to determine the disposal requirements. The regulatory criteria are summarized in Table 3-1 of the approved FSP (January 18, 2007) and are not repeated here for the sake of brevity. Any debris or soils containing concentrations of total PCBs greater than the regulatory standards and dioxin concentration less than 1ppm will be disposed of as PCB remediation wastes.

Following excavation of the CDA, final verification samples will be collected from the bottom and sidewalls of the excavation to establish that the complete extent of contamination has been removed prior to site restoration. Samples will be analyzed for target analyte list (TAL) metals and cyanide, target compound list (TCL) VOCs, TCL SVOCs, TCL pesticides, and TCL PCBs and the results will be compared against the New Jersey Department of Environmental Protection (NJDEP) Impact to Groundwater Soil Cleanup Criteria (IGWSCC) to verify that the full extent of contamination has been removed from the CDA. In instances where IGWSCC are not available, the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) will be utilized. Samples will also be analyzed for dioxins and dibenzofurans. The USEPA ROD (September 2004) includes a site cleanup criteria for dioxin and dibenzofurans as 5ppb toxic equivalent (TEQ). TEQ will be calculated using dioxin and dibenzofuran isomers only; PCBs will not be considered when making this calculation. For non-detected congeners, the laboratory will substitute zero for that congener in the calculation. Per the revised site Excavation Plan, excavations will continue until the bottom and sidewall concentrations of the target compounds are shown to be below the applicable cleanup criteria. A summary of the cleanup criteria are included in Table 1.

TABLE 1: FINAL VERIFICATION SAMPLE ACTION LEVELS

Contaminant	NJDEP IGWSCC	Laboratory Reporting Limit
TCL VOCs (µg/Kg)[1]		
Acetone	100,000	10.0
Acrylonitrile	1,000	10.0
Benzene	1,000	2.0
Bromodichloromethane	1,000	2.0
Bromoform	1,000	2.0
Bromomethane	1,000	10.0
2-Butanone	50,000	10.0
Carbon Tetrachloride	1,000	2.0
Chlorobenzene	1,000	2.0
Chloroform	1,000	2.0
Chloromethane	10,000	10.0
Dibromochloromethane	1,000	2.0
1,1-Dichloroethane	10,000	2.0
1,2-Dichloroethane	1,000	2.0
1,1-Dichloroethene	10,000	2.0
cis-1,2-Dichloroethene	1,000	2.0
trans-1,2-Dichloroethene	50,000	2.0
1,2-Dichloropropane	43,000[2]	2.0

TABLE 1: FINAL VERIFICATION SAMPLE ACTION LEVELS		
Contaminant	**NJDEP IGWSCC**	**Laboratory Reporting Limit**
cis&trans-1,3-Dichloropropene	1,000	2.0
Ethylbenzene	100,000	2.0
Methylene Chloride	1,000	2.0
4-Methyl-2-Pentanone	50,000	10.0
Styrene	100,000	2.0
1,1,1,2-Tetrachloroethane	1,000	2.0
1,1,2,2-Tetrachloroethane	1,000	2.0
Tetrachloroethene	1,000	2.0
Toluene	500,000	2.0
1,1,1-Trichloroethane	50,000	2.0
1,1,2-Trichloroethane	1,000	2.0
Trichloroethene	1,000	2.0
Vinyl Chloride	10,000	10.0
Xylenes (Total)	67,000	4.0
TCL SVOCs (µg/Kg)[3]		
Acenaphthene	100,000	67
Anthracene	100,000	67
Benzo(a)anthracene	500,000	67
Benzo(a)pyrene	100,000	67
Benzo(b)fluoranthene	50,000	67
Benzo(k)fluoranthene	500,000	67
Benzyl Alcohol	50,000	67
Butylbenzylphthalate	100,000	67
di-n-Butylphthalate	100,000	67
4-Chloroaniline	4,200,000[2]	67
bis(2-Chloroethyl)Ether	10,000	67
bis(2-Chloroisopropyl)Ether	10,000	67
4-Chloro-3-Methylphenol	100,000	133
2-Chlorophenol	10,000	130
Chrysene	500,000	67
Dibenzo(a,h)anthracene	100,000	67
1,2-Dichlorobenzene	50,000	67
1,3-Dichlorobenzene	100,000	67
1,4-Dichlorobenzene	100,000	67
3,3'-Dichlorobenzidine	100,000	67
2,4-Dichlorophenol	10,000	130
Diethylphthalate	50,000	67
2,4-Dimethylphenol	10,000	130
Dimethylphthalate	50,000	67
2,4-Dinitrophenol	10,000	130
Dinitrotoluene (2,4-/2,6-mixture)	10,000	67

TABLE 1: FINAL VERIFICATION SAMPLE ACTION LEVELS		
Contaminant	**NJDEP IGWSCC**	**Laboratory Reporting Limit**
bis(2-Ethylhexyl)phthalate	100,000	67
Fluoranthene	100,000	67
Fluorene	100,000	67
Hexachlorobenzene	100,000	67
Hexachlorobutadiene	100,000	67
Hexachlorocyclopentadiene	100,000	130
Hexachloroethane	100,000	67
Indeno(1,2,3-cd)pyrene	500,000	67
Isophorone	50,000	67
2-Methylphenol	10,000,000[2]	67
4-Methylphenol	10,000,000[2]	67
Naphthalene	100,000	67
Nitrobenzene	10,000	67
N-Nitrosodiphenylamine	100,000	67
N-Nitroso-di-n-Propylamine	10,000	67
di-n-Octylphthalate	100,000	67
Pentachlorophenol	100,000	130
Phenol	50,000	130
Pyrene	100,000	67
1,2,4-Trichlorobenzene	100,000	67
2,4,5-Trichlorophenol	50,000	67
2,4,6-Trichlorophenol	10,000	130
TCL Pesticides (µg/Kg)[4]		
Aldrin	50,000	0.400
4,4'-DDD	50,000	0.400
4,4'-DDE	50,000	0.400
4,4'-DDT	500,000	0.400
Dieldrin	50,000	0.400
Endosulfan	50,000	0.400
Endrin	50,000	0.400
Gamma-BHC	50,000	0.400
Heptachlor	50,000	0.400
Methoxychlor	50,000	0.400
Toxaphene	50,000	8.30
PCBs (µg/Kg)		
PCBs	50,000	3.30
TAL Metals (mg/Kg)[2, 5]		
Antimony	340	1.40
Arsenic	20	1.70
Barium	47,000	1.00
Beryllium	2	0.50

TABLE 1: FINAL VERIFICATION SAMPLE ACTION LEVELS		
Contaminant	**NJDEP IGWSCC**	**Laboratory Reporting Limit**
Cadmium	100	1.00
Chromium – hexavalent (VI)	6,100	1.00
Copper	600	1.00
Cyanide	21,000	0.50
Lead	600	4.10
Mercury	270	0.014
Nickel	2,400	1.00
Selenium	3,100	1.40
Silver	4,100	0.50
Thallium	2	1.30
Vanadium	7,100	1.00
Zinc	1,500	4.00

[1] IGWSCC and NRDCSCC are not available for carbon disulfide, chloroethane, 2-hexanone, and vinyl acetate.
[2] IGWSCC not included. NRDCSCC utilized.
[3] IGWSCC and NRDCSCC are not available for acenapthylene, benzidine, benzo(g,h,i)perylene, benzoic acid, 4-bromophenyl-phenylether, carbazole, bis(2-chloroethoxy)methane, 2-chloronaphthalene, 4-chlorophenyl-phenylether, dibenzofuran, 4,6-dinitro-2-methylphenol, 2-methylnaphthalene, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2-nitrophenol, , 4-nitrophenol, N-nitrosodimethylamine, and phenanthrene.
[4] IGWSCC and NRDCSCC are not available for alpha-BHC, beta-BHC, delta-BHC, chlordane, endosulfan II, endosulfan sulfate, endrin aldehyde, endrin ketone, and heptachlor epoxide.
[5] IGWSCC and NRDCSCC are not available for aluminum, calcium, chromium – trivalent, cobalt, iron, magnesium, manganese, sodium, and potassium.
Reference: NJDEP SRP Regulations and Guidance, Last Updated 5/12/99; http://www.state.nj.us/dep/srp/regs/scc/

2.0 Sample Collection Procedures

2.1 Solid Waste Characterization Samples

Prior to excavation activities, in-situ soil samples will be collected for waste characterization and disposal facility approval. The waste characterization samples will be analyzed for corrosivity, ignitability, hydrogen cyanide reactivity, hydrogen sulfide reactivity, TCLP VOCs, TCLP SVOCs, TCLP pesticides, TCLP herbicides, TCLP metals (including copper, nickel, and zinc), total PCBs, and dioxins/ dibenzofurans by the contract laboratory as summarized in Table 2. An estimated total of 57 waste characterization samples will be collected. The sample results and the completed waste profile will be sent to the offsite disposal facility for waste shipment approval.

Soil samples will be collected based on a 30-foot grid, to a depth of 6-feet to 8-feet below ground surface (bgs). The size of the grids will result in the collection of one composite sample for approximately every 250 cubic yards (yd^3) of soil scheduled for excavation and offsite disposal. Soil samples will be collected from the center of each grid using a utility backhoe. The backhoe will remove soil every 2-feet to the pre-determined depth of the excavation (i.e., 6-8 feet bgs). A photoionization detector (PID) reading will be recorded for each volume of soil removed, and two four-ounce sample jars will immediately be filled (i.e., zero headspace) for VOC analysis. The sample jars associated with the highest PID reading will be submitted to the laboratory for analysis (i.e., only one sample for VOC analysis will be submitted to the laboratory from each grid). For parameters other than VOCs, grab samples will be collected from each 2-foot interval directly from the backhoe bucket using a disposable sample trowel; the 3 or 4 grab samples will be composited such that one sample is submitted to the laboratory from each grid. The samples will be collected as follows:

- Gloves will be donned immediately prior to sampling and a clean pair of new disposable gloves will be worn each time a different location is sampled.
- The backhoe will remove a small amount of material from the desired sampling location. A PID measurement will be recorded. Two four-ounce sample jars will be filled with zero headspace, labeled with the sample depth, and placed on ice. A representative sample will be removed from the center of the backhoe bucket using a disposable sample trowel, taking care not to touch the sides of the backhoe bucket. The grab sample will be placed into a clean aluminum bowl. The extra material in the backhoe bucket will be placed back in the excavation area. This procedure will be repeated for each grid to the required depth of the excavation (i.e., 6-feet or 8-feet bgs).
- The sample aliquots in the bowl will be homogenized with the sample trowel or by physically mixing the soil by gloved hands. At no time will a bare hand come into contact with the sample.
- Place the homogenized soil into the appropriate sample containers as specified in Table 2 (i.e., one 32-ounce jar and two four-ounce jars). Any leftover sample material from the bowl will be placed back into the excavation area.
- Based on the PID readings, determine the depth with the highest reading. The two four-ounce sample jars collected immediately and placed on ice associated with this depth will be submitted to the laboratory for VOC analysis. The material in the other jars will be placed back in the excavation.
- Label the sample bottles using the sample identification system provided in the site FSP (January 18, 2007). Decontaminate any non-dedicated sampling equipment following the procedures included in the site FSP (January 18, 2007).

- Complete all chain of custody (COC) documentation and field logbooks as described in the FSP (January 18, 2007).

2.2 Final Verification Samples

Soil samples will be collected at the site in order to provide the data necessary to establish that soil with concentrations greater than the cleanup criteria (Table 1) have been removed from the excavation prior to site restoration. Samples will be collected from the floor and sidewalls of the excavation. Soils will be analyzed for TAL metals and cyanide; TCL VOCs, TCL SVOCs, TCL pesticides, and TCL PCBs by the contract laboratory as summarized in Table 2. Approximately 200 verification samples will be collected. Soils will also be analyzed for dioxins and dibenzofurans at a lesser frequency; approximately 50 samples will be collected.

Grid floor verification soil samples will be collected at the bottom center of each 30-foot grid (i.e., one sample every 900 square feet (ft^2)). Sidewall verification samples will be collected from the horizontal and vertical midpoint of the sidewall every 30-feet of the excavation. A PID will be utilized to determine where the sample for VOC analysis should be collected; the sample will be collected at the bottom of each 30-foot grid with the highest PID reading and along each 30-feet of sidewall with the highest PID reading. Dioxin/dibenzofuran grid floor verification samples will be collected as one composite sample from every four grids. Sidewall verification samples will be collected for dioxin/dibenzofuran at the direction of USACE and USEPA. If a grid verification sample exceeds the cleanup criteria (Table 1), additional soil will be removed and the grid bottom and sidewalls will be tested again. This process will be repeated until grid verification sample results less than the cleanup criteria are detected.

VOC samples will be collected using 5-gram EnCore™ samplers. In order to minimize the possibility for loss of volatile components, VOC samples will be collected as soon as possible, prior to collecting the samples for the other required parameters. The following procedure will be utilized to collect the VOC samples:

- Gloves will be donned immediately prior to sampling and a clean pair of new disposable gloves will be worn each time a different location is sampled.
- Determine the sample location based on the greatest PID reading along the floor and each sidewall of each 900ft^2 grid.

- The sample collection process should be completed in a minimal amount of time with the least amount of disruption as possible. Rough trimming of the sample location surface layer should be considered if the material may have already lost VOCs (e.g., been exposed for more than a few minutes) or if other waste, different soil strata, or vegetation may have contaminated it. Surface layers can be removed by scraping the surface with a clean spade.
- Insert the clean coring tool into a fresh surface for sample collection. Take care not to trap air behind the sample. An undisturbed sample is collected by pushing the barrel of the coring tool into a freshly exposed surface and removing the corer once it is filled.
- The exterior of the barrel should be quickly wiped with a clean disposable towel to ensure a tight seal and the cap snapped in the open end.
- The sampler should be labeled, inserted into the sealable pouch, and immediately placed on ice.
- If samples are going to be shipped near the weekend or holiday, coordinate with the receiving laboratory to ensure that the 48-hour holding time for the EnCore™ sample is met.

Final verification samples for dioxin and dibenzofuran analysis will be collected as follows:

- Gloves will be donned immediately prior to sampling and a clean pair of new disposable gloves will be worn each time a different location is sampled.
- Insert trowel into soil to the desired depth and remove the sample.
- Repeat in each of four adjacent grid floors, placing the material into a clean aluminum container to be composited. Sample aliquots from each grid floor will be homogenized by physically mixing the soil by gloved hand or with the sample trowel. At no time will a bare hand come into contact with the sample.
- Place the homogenized soil into the appropriate sample container as specified in Table 2.

Final verification samples for the other parameters will be collected as follows:

- Gloves will be donned immediately prior to sampling and a clean pair of new disposable gloves will be worn each time a different location is sampled.
- Insert trowel into soil to the desired depth and remove the sample.
- Place the sample into a clean aluminum container to be homogenized. Samples will be homogenized by physically mixing the soil by gloved hand or with the sample trowel. At no time will a bare hand come into contact with the sample.

- Place the homogenized soil into the appropriate sample container as specified in Table 2. Label the sample bottles using the sample identification system provided in the site FSP (January 18, 2007). Decontaminate any non-dedicated sampling equipment following the procedures included in the site FSP (January 18, 2007).
- Any leftover sample material from the bowl will be placed back into the excavation area.
- Complete all chain of custody (COC) documentation and field logbooks as described in the FSP (January 18, 2007).

TABLE 2: SAMPLING AND ANALYSIS MATRIX

Sample	*Location*	*Rationale*	*Parameter(s)*	*Sample Type*	*Type of Bottles*[1,2]	*Number of Bottles*[1,2]	*Methodology*	*Holding Time*[3]	*Preservative*
Solid Waste Characterization	In-situ CDA	Meet federal, state, and local regulations in accordance with the requirements of the disposal facility	Ignitability	Composite	32oz. CWM	1	SW-846 1010	7 days	Cool 4°C
			Corrosivity				SW-846 9045C	14 days	
			Reactive Cyanide				SW-846 Section 7.4.3.2/ Method 9014	14 days	
			Reactive Sulfide				SW-846 Section 7.4.4.2/ Method 9034	7 days	
			TCLP Metals (including copper, nickel, and zinc)				SW-846 1311/3015/6010B/ 7470A	180 days to TCLP extraction (Hg 28 days) 180 days to analysis (Hg 28 days)	
			TCLP SVOCs				SW-846 1311/3510C/8270C	14 days to TCLP extraction 7 days to preparative extraction 40 days to analysis	
			TCLP Pesticides				SW-846 1311/3510C/8081A	14 days to TCLP extraction 7 days to preparative extraction 40 days to analysis	
			TCLP Herbicides				SW-846 1311/3510C/8151A	14 days to TCLP extraction 7 days to preparative extraction 40 days to analysis	
			Total PCBs	Composite	4 oz. CWM	1	SW-846 3550C/8082	14 days to extraction 40 days to analysis	Cool 4°C
			TCLP VOCs	Grab	4 oz. CWM	2	SW-846 1311/5030B/8260B	14 days to TCLP extraction 14 days to analysis	Cool 4°C, zero headspace
			Dioxins/Dibenzofurans	Composite	4 oz. AG	1	SW-846 8280	30 days to extraction 45 days to extraction	Cool 4°C

TABLE 2: SAMPLING AND ANALYSIS MATRIX									
Sample	*Location*	*Rationale*	*Parameter(s)*	*Sample Type*	*Type of Bottles*[1,2]	*Number of Bottles*[1,2]	*Methodology*	*Holding Time*[3]	*Preservative*
Final Verification Samples	Excavation Floors and Sidewalls	Verify the soils with concentrations greater than the cleanup criteria have been removed from the excavations prior to site restoration	TCL VOCs	Grab	EnCore™ sampler	2	SW-846 5035/8260B	48 hours to preservation by laboratory 14 days to analysis	Cool 4°C
			TCL SVOCs	Grab	2oz. CWM	2	SW-846 3550C/8270C	14 days to extraction 40 days to analysis	Cool 4°C
			TCL Pesticides	Grab	2oz. CWM	2	SW-846 3550C/8081A	14 days to extraction 40 days to analysis	Cool 4°C
			Total PCBs	Grab	2oz. CWM	2	SW-846 3550C/8082	14 days to extraction 40 days to analysis	Cool 4°C
			Cyanide	Grab	2oz. CWM	2	SW-846 Section 7.4.3.2/ Method 9014	14 days	Cool 4°C
			TAL Metals	Grab	2oz. CWM	2	SW-846 3050/6010B/7471A	180 days to digestion 180 days to analysis (Hg 28 days)	Cool 4°C
			Dioxins/Dibenzofurans	Composite	4 oz. AG	1	SW-846 8290	30 days to extraction 45 days to extraction	Cool 4°C

Notes:
[1] Bottle types – AG: Amber Glass; HDPE: High Density Polyethylene Plastic; CWM: Clear wide mouth glass jar with Teflon lid
[2] All bottles should be filled completely with zero head space
[3] From Verified Time of Sample Collection

2.3 Quality Control Samples

Quality control (QC) samples will be collected and analyzed in order to verify the contact laboratory's performance. QC samples will be collected at a frequency of 10% of field samples collected for offsite analysis per matrix (i.e., waste characterization and final verification samples) and will include blind field replicates, matrix and matrix spike duplicates, and temperature blanks sent to the primary laboratory. A discussion of field QC samples is included in Section 4.8 of the site FSP (January 18, 2007) and is not repeated here for the sake of brevity.

3.0 Quality Assurance Project Plan

The previously-approved project QAPP (Revision 2, April 17, 2007) will be followed for the CDA sampling activities. Revisions to QAPP worksheets specific to the sampling activities described in this addendum follow.

PROBLEM DEFINITION

The Cornell-Dubilier Electronics Superfund Site CDA may contain materials that may be regulated when managed for disposal. Soil and debris need to be characterized to determine what materials require disposal as hazardous waste and as regulated non-hazardous waste. In addition, excavations will have to be shown to contain no contaminants of concern greater than the New Jersey Department of Environmental Protection (NJDEP) Impact to Groundwater Soil Cleanup Criteria (IGWSCC) and USEPA ROD criteria prior to site restoration.

PROJECT DESCRIPTION

The scope of the remedial action involves the removal and offsite disposal of soils and debris associated with the CDA. Samples will be collected for characterization of soil and debris to determine the offsite disposal requirements. In addition, final verification samples will be collected from the bottom and sidewalls of the excavation to establish that the complete extent of contamination has been removed prior to site restoration.

PROJECT DECISION CONDITIONS

Soil and debris samples will be collected for waste characterization and disposal facility approval. Waste characterization samples will be compared against the 40CFR261 *Characteristics of Hazardous Waste* and 40CFR761 *PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions* to determine the disposal requirements. Any debris or soils containing concentrations of total PCBs greater than the regulatory standards and dioxin concentration less than 1ppm will be disposed of as PCB remediation wastes.

Final verification samples will be collected and analyzed to verify that there are no contaminants of concern left behind prior to site restoration. NJDEP IGWSCC will be used to verify that site remediation is complete. The USEPA ROD (September 2004) includes a site cleanup criteria for dioxin and dibenzofurans as 5ppb toxic equivalent (TEQ). TEQ will be calculated using dioxin and dibenzofuran isomers only; PCBs will not be considered when making this calculation. For non-detected congeners, the laboratory will substitute zero for that congener in the calculation.

QAPP Worksheet #12-12A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	TCLP Metals
Concentration Level	Unknown

Sampling Procedure	**Analytical Method/SOP**[1]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
Addendum Section 2.1	M-1311-03-XX M-ICP-06-XX M-MERC-05-XX	Precision	RPD≤25%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	75-125% recovery	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	80-120% recovery	Laboratory Control Sample	A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-13A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	TCLP VOCs
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Section 2.1	M-1311-03-XX M-8260-07-XX	Precision	RPD≤20%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS analysis is required per the analytical method. The analysis may or may not be performed using a Site sample; i.e., it may be performed using a sample from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-14A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	TCLP SVOCs
Concentration Level	Unknown

Sampling Procedure	**Analytical Method/SOP**[1]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
Addendum Section 2.1	M-1311-03-XX M-8270-05-XX	Precision	RPD≤30%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS analysis is required per the analytical method. The analysis may or may not be performed using a Site sample; i.e., it may be performed using a sample from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-15A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	TCLP Pesticides
Concentration Level	Unknown

Sampling Procedure	**Analytical Method/SOP[1]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
Addendum Section 2.1	M-1311-03-XX M-8081A-07-XX	Precision	RPD≤25%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS analysis is required per the analytical method. The analysis may or may not be performed using a Site sample; i.e., it may be performed using a sample from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-16A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	TCLP Herbicides
Concentration Level	Unknown

Sampling Procedure	**Analytical Method/SOP[1]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
Addendum Section 2.1	M-1311-03-XX M-8151A-05-XX	Precision	RPD≤30%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS analysis is required per the analytical method. The analysis may or may not be performed using a Site sample; i.e., it may be performed using a sample from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-17A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	PCBs
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Sections 2.1 and 2.2	M-8082-03-XX	Precision	RPD≤30%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-18A
Measurement Performance Criteria Table

Matrix	Soil and Debris
Analytical Group	Dioxins/ Dibenzofurans
Concentration Level	Unknown

Sampling Procedure	**Analytical Method/SOP**[1]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
Addendum Section 2.1	SW846 Method 8280	Precision	RPD<20%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	70-130% recovery	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	70-130% recovery	Laboratory Control Sample	A
		Accuracy	25-150% recovery	Extraction Standards	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23
[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-19A
Measurement Performance Criteria Table

Matrix	Soil
Analytical Group	VOCs
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Section 2.2	M-8260-07-XX	Precision	RPD≤25%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Precision	RPD≤20%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23
[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-20A
Measurement Performance Criteria Table

Matrix	Soil
Analytical Group	SVOCs
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Section 2.2	M-8270-05-XX	Precision	RPD≤35%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Precision	RPD≤30%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-21A
Measurement Performance Criteria Table

Matrix	Soil
Analytical Group	Pesticides
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
FSP Section 4.6	M-8081A-07-XX	Precision	RPD≤30%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Precision	RPD≤25%	Laboratory Control Sample/Laboratory Control Sample Duplicate	A
		Accuracy	See Appendix C of primary site SAP	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	See Appendix C of primary site SAP	Laboratory Control Sample	A
		Accuracy	See Appendix C of primary site SAP	Surrogate Spikes	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23
[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-22A
Measurement Performance Criteria Table

Matrix	Soil
Analytical Group	Metals
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Section 2.2	M-ICP-06-XX M-MERC-05-XX	Precision	RPD≤25%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	75-125% recovery	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	80-120% recovery	Laboratory Control Sample	A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #12-23A
Measurement Performance Criteria Table

Matrix	Soil
Analytical Group	Dioxins/ Dibenzofurans
Concentration Level	Unknown

Sampling Procedure	Analytical Method/SOP[1]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Addendum Section 2.2	SW846 Method 8290	Precision	RPD<20%	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	70-130% recovery	Matrix Spike/Matrix Spike Duplicate[2]	S&A
		Accuracy	70-130% recovery	Laboratory Control Sample	A
		Accuracy	40-135% recovery	Extraction Standards	S&A
		Accuracy	±4°C	Temperature Blank	S
		Sensitivity	≤PQL	Method Blank	A
		Completeness	≥95%	Data Assessment	S&A
		Comparability	Similar units and methods	Data results review	S&A

[1] Reference number from Worksheet #23

[2] MS and MSD analyses are required per the analytical method. The analyses may or may not be performed using Site samples; i.e., they may be performed using samples from another laboratory project prepared and analyzed in the same analytical batch.

QAPP Worksheet #15-13A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: VOCs
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)	MDLs (µg/Kg)	QLs (µg/Kg)
Acetone	67-64-1	100,000	10.0	NA	NA	3.55	10.0
Acrylonitrile	107-13-1	1,000	10.0	NA	NA	0.98	10.0
Benzene	71-43-2	1,000	2.0	NA	NA	0.18	2.0
Bromodichloromethane	75-27-4	1,000	2.0	NA	NA	0.26	2.0
Bromoform	75-25-2	1,000	2.0	NA	NA	0.43	2.0
Bromomethane	74-83-9	1,000	10.0	NA	NA	2.14	10.0
2-Butanone	78-93-3	50,000	10.0	NA	NA	2.85	10.0
Carbon Tetrachloride	56-23-5	1,000	2.0	NA	NA	0.26	2.0
Chlorobenzene	108-90-7	1,000	2.0	NA	NA	0.38	2.0
Chloroform	67-66-3	1,000	2.0	NA	NA	0.43	2.0
Chloromethane	74-87-3	10,000	10.0	NA	NA	0.95	10.0
Dibromochloromethane	124-48-1	1,000	2.0	NA	NA	0.43	2.0
1,1-Dichloroethane	75-34-3	10,000	2.0	NA	NA	0.34	2.0
1,2-Dichloroethane	107-06-2	1,000	2.0	NA	NA	0.42	2.0
1,1-Dichloroethene	75-35-4	10,000	2.0	NA	NA	0.55	2.0
cis-1,2-Dichloroethene	156-59-2	1,000	2.0	NA	NA	0.30	2.0
trans-1,2-Dichloroethene	156-60-5	50,000	2.0	NA	NA	0.34	2.0
1,2-dichloropropane	78-87-5	43,000	2.0	NA	NA	0.32	2.0
1,3-dichloropropene (cis and trans)	10061-01-5 (cis) 10061-02-6 (trans)	1,000	2.0	NA	NA	0.42 (cis) 0.20 (trans)	2.0
Ethylbenzene	100-41-4	100,000	2.0	NA	NA	0.12	2.0
Methylene Chloride	75-09-2	1,000	2.0	NA	NA	2.39	2.0
4-Methyl-2-Pentanone	108-10-1	50,000	10.0	NA	NA	1.10	10.0
Styrene	100-42-5	100,000	2.0	NA	NA	0.20	2.0
1,1,1,2-Tetrachloroethane	630-20-6	1,000	2.0	NA	NA	0.44	2.0

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)	MDLs (µg/Kg)	QLs (µg/Kg)
1,1,2,2-Tetrachloroethane	79-34-5	1,000	2.0	NA	NA	0.30	2.0
Tetrachloroethene	127-18-4	1,000	2.0	NA	NA	0.23	2.0
Toluene	108-88-3	500,000	2.0	NA	NA	0.36	2.0
1,1,1-Trichloroethane	71-55-6	50,000	2.0	NA	NA	0.16	2.0
1,1,2-Trichloroethane	79-00-5	1,000	2.0	NA	NA	0.33	2.0
Trichloroethene	79-01-6	1,000	2.0	NA	NA	0.45	2.0
Vinyl Chloride	75-01-4	10,000	10.0	NA	NA	0.86	10.0
Xylenes (total)	1330-20-7	67,000	4.0	NA	NA	0.33 (m,p) 0.15 (o)	4.0

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

QAPP Worksheet #15-14A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: SVOCs
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)[3]	MDLs (µg/Kg)	QLs (µg/Kg)
Acenaphthene	83-32-9	100,000	67	NA	660	NA	67
Anthracene	120-12-7	100,000	67	NA	660	NA	67
Benzo(a)anthracene	56-55-3	500,000	67	NA	660	NA	67
Benzo(a)pyrene	50-32-8	100,000	67	NA	660	NA	67
Benzo(b)fluoranthene	205-99-2	50,000	67	NA	660	NA	67
Benzo(k)fluoranthene	207-08-9	500,000	67	NA	660	NA	67
Benzyl Alcohol	100-51-6	50,000	67	NA	1300	NA	67
Butyl benzyl phthalate	85-68-7	100,000	67	NA	660	NA	67
di-n-Butyl phthalate	84-74-2	100,000	67	NA	ND	NA	67
4-Chloroaniline	106-47-8	4,200,000	67	NA	1300	NA	67
Bis(2-chloroethyl)ether	111-44-4	10,000	67	NA	660	NA	67
Bis(2-chloroisoproyl)ether	108-60-1	10,000	67	NA	660	NA	67
4-Chloro-3-methylphenol	59-50-7	100,000	133	NA	1300	NA	133
2-Chlorophenol	95-57-8	10,000	130	NA	660	NA	130
Chrysene	218-01-9	500,000	67	NA	660	NA	67
Dibenzo(a,h)anthracene	53-70-3	100,000	67	NA	660	NA	67
1,2-Dichlorobenzene	95-50-1	50,000	67	NA	660	NA	67
1,3-Dichlorobenzene	541-73-1	100,000	67	NA	660	NA	67
1,4-Dichlorobenzene	106-46-7	100,000	67	NA	660	NA	67
3,3'-Dichlorobenzidine	91-94-1	100,000	67	NA	1300	NA	67
2,4-Dichlorophenol	120-83-2	10,000	130	NA	660	NA	130
Diethyl phthalate	84-66-2	50,000	67	NA	660	NA	67
2,4-Dimethylphenol	105-67-9	10,000	130	NA	660	NA	130
Dimethyl phthalate	131-11-3	50,000	67	NA	660	NA	67
2,4-Dinitrophenol	51-28-5	10,000	130	NA	3300	NA	130

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)[3]	MDLs (µg/Kg)	QLs (µg/Kg)
Dinitrotoluene (2,4-/2,6-mixture)	121-14-2 (2,4-) 606-20-2 (2,6-)	10,000	67	NA	660 (2,4-) 660 (2,6-)	NA	67
Bis(2-ethylhexyl)phthalate	117-81-7	100,000	67	NA	660	NA	67
Fluoranthene	206-44-0	100,000	67	NA	660	NA	67
Fluorene	86-73-7	100,000	67	NA	660	NA	67
Hexachlorobenzene	118-74-1	100,000	67	NA	660	NA	67
Hexachlorobutadiene	87-68-3	100,000	67	NA	660	NA	67
Hexachlorocyclopentadiene	77-47-4	100,000	130	NA	660	NA	130
Hexachloroethane	67-72-1	100,000	67	NA	660	NA	67
Indeno(1,2,3-cd)pyrene	193-39-5	500,000	67	NA	660	NA	67
Isophorone	78-59-1	50,000	67	NA	660	NA	67
2-Methylphenol	95-48-7	10,000,000	67	NA	660	NA	67
4-Methylphenol	106-44-5	10,000,000	67	NA	660	NA	67
Naphthalene	91-20-3	100,000	67	NA	660	NA	67
Nitrobenzene	98-95-3	10,000	67	NA	660	NA	67
N-Nitrosodiphenylamine	86-30-6	100,000	67	NA	660	NA	67
N-Nitroso-di-n-propylamine	621-64-7	10,000	67	NA	660	NA	67
di-n-Octylphthalate	117-84-0	100,000	67	NA	ND	NA	67
Pentachlorophenol	87-86-5	100,000	130	NA	3300	NA	130
Phenol	108-95-2	50,000	130	NA	660	NA	130
Pyrene	129-00-0	100,000	67	NA	660	NA	67
1,2,4-Trichlorobenzene	120-82-1	100,000	67	NA	660	NA	67
2,4,5-Trichlorophenol	95-95-4	50,000	67	NA	660	NA	67
2,4,6-Trichlorophenol	88-06-2	10,000	130	NA	660	NA	130

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

[3] ND = Not Determined

QAPP Worksheet #15-15A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Pesticides
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)	MDLs (µg/Kg)	QLs (µg/Kg)
Aldrin	309-00-2	50,000	0.400	NA	NA	0.0256	0.400
4,4'-DDD	72-54-8	50,000	0.400	NA	NA	0.0414	0.400
4,4'-DDE	72-55-9	50,000	0.400	NA	NA	0.0323	0.400
4,4'-DDT	50-29-3	500,000	0.400	NA	NA	0.0413	0.400
Dieldrin	60-57-1	50,000	0.400	NA	NA	0.1700	0.400
Endosulfan		50,000	0.400	NA	NA	0.0696	0.400
Endrin	72-20-8	50,000	0.400	NA	NA	0.1195	0.400
Gamma-BHC	58-89-9	50,000	0.400	NA	NA	0.0256	0.400
Heptachlor	76-44-8	50,000	0.400	NA	NA	0.0360	0.400
Methoxychlor	72-43-5	50,000	0.400	NA	NA	0.2878	0.400
Toxaphene	8001-35-2	50,000	8.30	NA	NA	NA	8.30

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

QAPP Worksheet #15-16A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: PCBs
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit (µg/Kg)	Project Quantitation Limit Goal (µg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (µg/Kg)	Method QLs (µg/Kg)[3]	MDLs (µg/Kg)	QLs (µg/Kg)
Aroclor 1016	12674-11-2	50,000	3.30	0.057 – 0 .070	38 – 47	1.67	3.30
Aroclor 1221	11104-28-2		3.30	0.057 – 0 .070	38 – 47	2.03	3.30
Aroclor 1232	11141-16-5		3.30	0.057 – 0 .070	38 – 47	0.600	3.30
Aroclor 1242	53469-21-9		3.30	0.057 – 0 .070	38 – 47	0.818	3.30
Aroclor 1248	12672-29-6		3.30	0.057 – 0 .070	38 – 47	0.527	3.30
Aroclor 1254	11097-69-1		3.30	0.057 – 0 .070	38 – 47	0.330	3.30
Aroclor 1260	11096-82-5		3.30	0.057 – 0 .070	38 - 47	0.630	3.30

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

[3] Per SW-846 Method 8082, the Estimated Quantitation Limit is the MDL (0.057mg/Kg to 0.070mg/Kg) times a factor (use 670 for low-concentration soil)

QAPP Worksheet #15-17A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Metals
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit (mg/Kg)	Project Quantitation Limit Goal (mg/Kg)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs (mg/Kg)	Method QLs (mg/Kg)	MDLs (mg/Kg)	QLs (mg/Kg)
Antimony	7440-36-0	340	1.40	NA	NA	NA	1.40
Arsenic	7440-38-2	20	1.70	NA	NA	NA	1.70
Barium	7440-39-3	47,000	1.00	NA	NA	NA	1.00
Beryllium	7440-41-7	2	0.50	NA	NA	NA	0.50
Cadmium	7440-43-9	100	1.00	NA	NA	NA	1.00
Chromium	7440-47-3	6,100	1.00	NA	NA	NA	1.00
Copper	7440-50-8	600	1.00	NA	NA	NA	1.00
Cyanide	57-12-5	21,000	0.50	NA	NA	NA	0.50
Lead	7439-92-1	600	4.10	NA	NA	NA	4.10
Mercury	7439-97-6	270	0.014	NA	NA	NA	0.014
Nickel	7440-02-0	2,400	1.00	NA	NA	NA	1.00
Selenium	7782-49-2	3,100	1.40	NA	NA	NA	1.40
Silver	7440-22-4	4,100	0.50	NA	NA	NA	0.50
Thallium	7440-28-0	2	1.30	NA	NA	NA	1.30
Vanadium	7440-62-2	7,100	1.00	NA	NA	NA	1.00
Zinc	7440-66-6	1,500	4.00	NA	NA	NA	4.00

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

QAPP Worksheet #15-18A
Reference Limits and Evaluation Table

Matrix: Soil and Debris
Analytical Group: Dioxins and Dibenzofurans (Method 8280)
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit	Project Quantitation Limit Goal (ng/g)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs	Method QLs (µg/Kg)	MDLs	QLs (ng/g)
2,3,7,8-TCDD	1746-01-6	*	1	NA	1.0	NA	1
1,2,3,7,8-PeCDD	40321-76-4	*	1	NA	2.5	NA	1
1,2,3,4,7,8-HxCDD	39227-28-6	*	2.5	NA	2.5	NA	2.5
1,2,3,6,7,8-HxCDD	57653-85-7	*	2.5	NA	2.5	NA	2.5
1,2,3,7,8,9-HxCDD	19408-74-3	*	2.5	NA	2.5	NA	2.5
1,2,3,4,6,7,8-HpCDD	35822-46-9	*	2.5	NA	2.5	NA	2.5
1,2,3,4,6,7,8,9-OCDD	3268-87-9	*	5	NA	5.0	NA	5
2,3,7,8-TCDF	51207-31-9	*	1	NA	1.0	NA	1
1,2,3,7,8-PeCDF	57117-41-6	*	1	NA	2.5	NA	1
2,3,4,7,8-PeCDF	57117-31-4	*	1	NA	2.5	NA	1
1,2,3,4,7,8-HxCDF	70648-26-9	*	2.5	NA	2.5	NA	2.5
1,2,3,6,7,8-HxCDF	57117-44-9	*	2.5	NA	2.5	NA	2.5
1,2,3,7,8,9-HxCDF	72918-21-9	*	2.5	NA	2.5	NA	2.5
2,3,4,6,7,8-HxCDF	60851-34-5	*	2.5	NA	2.5	NA	2.5
1,2,3,4,6,7,8-HpCDF	67562-39-4	*	2.5	NA	2.5	NA	2.5
1,2,3,4,7,8,9-HpCDF	55673-89-7	*	2.5	NA	2.5	NA	2.5
1,2,3,4,5,6,7,8-OCDF	39001-02-0	*	5	NA	5.0	NA	5

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

* The project action level for dioxin is 1ppm.

QAPP Worksheet #15-19A
Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Dioxins and Dibenzofurans (Method 8290)
Concentration Level: Unknown

Analyte	CAS Number	Project Action Limit	Project Quantitation Limit Goal (pg/g)	Analytical Method[1]		Achievable Laboratory Limits[2]	
				MDLs	Method QLs	MDLs	QLs (pg/g)
2,3,7,8-TCDD	1746-01-6	*	1	NA	NA	NA	1
1,2,3,7,8-PeCDD	40321-76-4	*	5	NA	NA	NA	5
1,2,3,4,7,8-HxCDD	39227-28-6	*	5	NA	NA	NA	5
1,2,3,6,7,8-HxCDD	57653-85-7	*	5	NA	NA	NA	5
1,2,3,7,8,9-HxCDD	19408-74-3	*	5	NA	NA	NA	5
1,2,3,4,6,7,8-HpCDD	35822-46-9	*	5	NA	NA	NA	5
1,2,3,4,6,7,8,9-OCDD	3268-87-9	*	10	NA	NA	NA	10
2,3,7,8-TCDF	51207-31-9	*	1	NA	NA	NA	1
1,2,3,7,8-PeCDF	57117-41-6	*	5	NA	NA	NA	5
2,3,4,7,8-PeCDF	57117-31-4	*	5	NA	NA	NA	5
1,2,3,4,7,8-HxCDF	70648-26-9	*	5	NA	NA	NA	5
1,2,3,6,7,8-HxCDF	57117-44-9	*	5	NA	NA	NA	5
1,2,3,7,8,9-HxCDF	72918-21-9	*	5	NA	NA	NA	5
2,3,4,6,7,8-HxCDF	60851-34-5	*	5	NA	NA	NA	5
1,2,3,4,6,7,8-HpCDF	67562-39-4	*	5	NA	NA	NA	5
1,2,3,4,7,8,9-HpCDF	55673-89-7	*	5	NA	NA	NA	5
1,2,3,4,5,6,7,8-OCDF	39001-02-0	*	10	NA	NA	NA	10

[1]Analytical MDLs and QLs are those documented in validated methods. NA indicates that the MDLs and method QLs are not provided in the most recent version of the SW-846 method for the parameters and matrices of interest.

[2]Achievable MDLs and QLs are limits that an individual laboratory can achieve when performing a specific analytical method.

* The project action level for dioxin TEQ is 5ppb.

QAPP Worksheet #18A
Sampling Locations and Methods/SOP Requirements Table

Sampling Location/AOC	Matrix	Depth	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
CDA	Soil and debris	Pre-determined depth (6-8 feet below ground surface)	TCLP Metals TCLP VOCs TCLP SVOCs TCLP Pesticides TCLP Herbicides PCBs Dioxins/Dibenzofurans	Unknown	Estimated total number of samples: 57 Estimated number of field duplicates: 5	Addendum Section 2.1	Waste characterization and disposal facility approval
Final verification samples	Soil	NA	VOCs SVOCs Pesticides PCBs Metals Dioxins/Dibenzofurans	Unknown	Estimated total number of samples: 200 (50 samples for dioxin/dibenzofuran analysis) Estimated number of field duplicates: 20 (5 duplicate sample for dioxin/dibenzofuran analysis)	Addendum Section 2.2	Verify that soil with concentrations greater than the cleanup criteria have been removed prior to site restoration

QAPP Worksheet #19A
Analytical SOP Requirements Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference[1]	Sample Volume	Containers[2] (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)
Solid Waste Characterization	Ignitability	Unknown	SW-846 1010	NA	1, 32oz. G	Cool 4°C	7 days
	Corrosivity (i.e., pH)	Unknown	SW-846 9045C	NA			14 days
	Reactive Cyanide	Unknown	SW-846 Section 7.4.3.2/Method 9014	NA			7 days
	Reactive Sulfide	Unknown	SW-846 Section 7.4.4.3/Method 9034	NA			7 days
	TCLP Metals	Unknown	SW-846 1311/3015/6010B	60g			180 days
	TCLP Mercury	Unknown	SW-846 1311/3015/7470A				28 days
	TCLP SVOCs	Unknown	SW-846 1311/3510C/8270C	60 g			14/7/40 days
	TCLP Pesticides	Unknown	SW-846 1311/3510C/8081A				14/7/40 days
	TCLP Herbicides	Unknown	SW-846 1311/3510C/8151A				14/7/40 days
	PCBs	Unknown	SW-846 3550C/8082	60g	1, 8oz. G		14/40 days
	TCLP VOCs	Unknown	SW-846 1311/5030B/8260B	5g	2, 4oz. GT		14/14 days
	Dioxins/Dibenzofurans	Unknown	SW-846 8280	NA	1, 4oz. AG		30/45 days

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference[1]	Sample Volume	Containers[2] (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)
Final Verification Soil	VOCs	Unknown	SW-846 5035/8260B	5g	2, 5g Encore samplers 2, 2oz. GT	Cool 4°C	48 hours to Encore transfer 14 days to analysis
	SVOCs	Unknown	SW-846 3550C/8270C	60g	2, 32oz. G		14/40 days
	Pesticides	Unknown	SW-846 3550C/8081A	60g			14/40 days
	PCBs	Unknown	SW-846 3550C/8082				14/40 days
	Cyanide	Unknown	SW-846 Section 7.4.3.2/Method 9014	60g			14 days
	Metals	Unknown	SW-846 3050/6010B	60g			180 days
	Mercury	Unknown	SW-846 3050/7471A				28 days
	Dioxins/Dibenzofurans	Unknown	SW-846 8290	NA	1, 4oz. AG		30/45 days

[1] Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).
[2] G = clear glass; T = Teflon lined lid; P = plastic; AG = amber glass

QAPP Worksheet #20A
Field Quality Control Sample Summary Table

Matrix	Analytical Group	Conc. Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of MS	No. of Field Blanks	No. of Equip. Blanks	No. of PT Samples	Total No. of Samples to Lab
Soil and Debris	TCLP Metals	Unknown	M-1311-03-XX M-ICP-06-XX M-MERC-05-XX	57	5	5	0	0	0	67
	TCLP VOCs	Unknown	M-1311-03-XX M-8260-07-XX							
	TCLP SVOCs	Unknown	M-1311-03-XX M-8270-05-XX							
	TCLP Pesticides	Unknown	M-1311-03-XX M-8081A-07-XX							
	TCLP Herbicides	Unknown	M-1311-03-XX M-8151A-05-XX							
	PCBs	Unknown	M-8082-03-XX							
	Dioxins/Dibenzofurans	Unknown	SW-846 8280							
Final Verification	VOCs	Unknown	M-8260-07-XX	200	20	20	0	0	0	240
	SVOCs	Unknown	M-8270-05-XX							
	Pesticides	Unknown	M-8081A-07-XX							
	PCBs	Unknown	M-8082-03-XX							
	Metals	Unknown	M-ICP-06-XX M-MERC-05-XX							
	Dioxins/Dibenzofurans	Unknown	SW-846 8290	50	5	5	0	0	0	60

QAPP Worksheet #28-7A
QC Samples Table

Matrix	Soil and Debris
Analytical Group	TCLP Metals
Concentration Level	Unknown
Sampling SOP	Addendum Section 2.1
Analytical Method/ SOP Reference	M-1311-03-XX M-ICP-06-XX M-MERC-05-XX
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	WST
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory Personnel	Accuracy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike/Matrix Spike Duplicate	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory Personnel	Precision Accuracy	RPD≤25% 75-125% recovery
LCS	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory Personnel	Accuracy	80-120% recovery
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C

QAPP Worksheet #28-8A
QC Samples Table

Matrix	Soil and Debris
Analytical Group	TCLP VOCs, SVOCs, Pesticides, Herbicides
Concentration Level	Unknown
Sampling SOP	Addendum Section 2.1
Analytical Method/ SOP Reference	M-1311-03-XX M-8260-07-XX M-8270-05-XX M-8081A-07-XX M-8151A-05-XX
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	WST
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory personnel	Accuracy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory personnel	Accuracy	See Appendix C of primary site SAP
Surrogate Spike	All field and QA samples	QAPP specified Measurement Performance Criteria.	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch if sufficient sample material is available.	Laboratory personnel	Accuracy	See Appendix C of primary site SAP
LCS/LCSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory personnel	Accuracy Precision	See Appendix C of primary site SAP
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C

QAPP Worksheet #28-9A
QC Samples Table

Matrix	Soil and Debris
Analytical Group	PCBs
Concentration Level	Unknown
Sampling SOP	Addendum Sections 2.1 and 2.2
Analytical Method/ SOP Reference	M-8082-03-XX
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	WST
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory personnel	Accuacy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
MS/MSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory Personnel	Precision Accuracy	See Appendix C of primary site SAP
Surrogate Spike	All field and QA samples	QAPP specified Measurement Performance Criteria.	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch if sufficient sample material is available.	Laboratory personnel	Accuracy	See Appendix C of primary site SAP
LCS/LCSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory personnel	Accuracy Precision	See Appendix C of primary site SAP

QAPP Worksheet #28-10A
QC Samples Table

Matrix	Soil
Analytical Group	VOCs, SVOCs, Pesticides
Concentration Level	Unknown
Sampling SOP	Addendum Section 2.2
Analytical Method/ SOP Reference	M-8260-07-XX M-8270-05-XX M-0881A-07-XX
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	WST
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory personnel	Accuacy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
MS/MSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory Personnel	Precision Accuracy	See Appendix C of primary site SAP
Surrogate Spike	All field and QA samples	QAPP specified Measurement Performance Criteria.	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch if sufficient sample material is available.	Laboratory personnel	Accuracy	See Appendix C of primary site SAP
LCS/LCSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory personnel	Accuracy Precision	See Appendix C of primary site SAP
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C

QAPP Worksheet #28-11A
QC Samples Table

Matrix	Soil
Analytical Group	Metals
Concentration Level	Unknown
Sampling SOP	Addendum Section 2.2
Analytical Method/ SOP Reference	M-ICP-06-XX M-MERC-05-XX
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	WST
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory personnel	Accuacy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
MS/MSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory Personnel	Precision Accuracy	RPD≤25% 75-125% recovery
LCS	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory personnel	Accuracy	80-120% recovery
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C

QAPP Worksheet #28-12A
QC Samples Table

Matrix	Soil
Analytical Group	Dioxins/Dibenzofurans
Concentration Level	Unknown
Sampling SOP	Addendum Sections 2.1 and 2.2
Analytical Method/ SOP Reference	SW-846 8280 SW-846 8290
Sampler's Name	TBD
Field Sampling Organization	Sevenson
Analytical Organization	SGS
No. of Sample Locations	See Worksheet #18A

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparatory batch	No analytes detected >1/2 reporting limit. For common laboratory contaminants, no analytes > reporting limit.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Laboratory personnel	Accuacy/Sensitivity	≤PQL

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
MS/MSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Examine the project-specific data quality objectives. Contact the client as to additional measures to be taken.	Laboratory Personnel	Precision Accuracy	RPD≤20% 70-130% recovery
Extraction Standard	All field and QA samples	QAPP specified Measurement Performance Criteria.	For QC and field samples, correct problem, then reprep and reanalyze all failed samples in the associated preparatory batch if sufficient sample material is available.	Laboratory personnel	Accuracy	SW846 8280: 25-150% recovery SW846 8290: 40-135% recovery
LCS/LCSD	One per preparatory batch	QAPP specified Measurement Performance Criteria.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Laboratory personnel	Accuracy Precision	70-130% recovery
Temperature Blank	Per Cooler	±4°C	Use more ice	William Zambrana, Sevenson	Accuracy	±4°C

QAPP Worksheet #30A
Analytical Services Table

Matrix	Analytical Group	Concentration Level	Sample Locations/ID Number	Analytical SOP	Data Package Turnaround Time	Laboratory / Organization (name and address, contact person and telephone number)	Backup Laboratory / Organization (name and address, contact person and telephone number)
Waste Characterization	Full TCLP, RCRA characteristics, PCBs	Unknown	CDA	M-1311-03-XX M-8081A-07-XX M-8082-03-XX M-8260-07-XX M-8270-05-XX M-ICP-06-XX M-MERC-05-XX M-8151A-05-XX M-1010-02-XX M-9045-04-XX M-RSULF-04-XX M-REACY-03-XX	30 days	WST 302 Grote Street Buffalo, NY 14207 Dan Vollmer 716-876-5290	N/A
	Dioxins/ Dibenzofurans	Unknown		SW-846 8280		SGS Environmental Services, Inc. 5500 Business Drive Wilmington, NC 28405 Chris Cornwell 910-350-1903	
Final Verification Soil	VOCs, SVOCs, pesticides, PCBs, cyanide, metals	Unknown	CDA	M-8081A-07-XX M-8082-03-XX M-8260-07-XX M-8270-05-XX M-ICP-06-XX M-MERC-05-XX	30 days	WST 302 Grote Street Buffalo, NY 14207 Dan Vollmer 716-876-5290	N/A

Matrix	Analytical Group	Concentration Level	Sample Locations/ID Number	Analytical SOP	Data Package Turnaround Time	Laboratory / Organization (name and address, contact person and telephone number)	Backup Laboratory / Organization (name and address, contact person and telephone number)
	Dioxins/ Dibenzofurans	Unknown		SW-846 8290		SGS Environmental Services, Inc. 5500 Business Drive Wilmington, NC 28405 Chris Cornwell 910-350-1903	

Attachment 1 – Revision 1

Data Quality Objectives

Operable Unit 2 – Building Demolition
Cornell-Dubilier Electronics Superfund Site
South Plainfield, New Jersey

Data quality objectives (DQOs) are used to help decision makers collect data of the right type, quality, and quantity to support decisions. The approach to developing DQOs is designed to take decision makers through a strategic planning process from broad project goals through a number of refining steps towards generating environmental data that will be appropriate to making the decisions needed to reach the goals.

1.0 State the Problem

The site formerly occupied by the Cornell-Dubilier Electronics, Inc. in South Plainfield, New Jersey will most likely be restored and redeveloped for commercial/industrial use. Soils contain contaminants of concern, primarily polychlorinated biphenyls (PCBs), which will need to be removed prior to redevelopment. Elevated concentrations of contaminants of concern in soils may pose a threat through direct contact and as a source of contamination to groundwater.

This task addresses a limited area of soils associated with Operable Unit 2 (OU2) of the site, designated the Capacitor Disposal Area (CDA). The objectives of the current remedial action are:

- Excavation, characterization, and offsite disposal of soils and associated materials from the CDA.
- Collection of final verification samples from the bottom and sidewalls of the excavations to establish that the complete extent of contamination has been removed prior to site restoration.

2.0 Identify the Decision

To meet the objectives, the following fundamental questions will need to be answered during the investigation:

- What is the nature and extent of contaminants of concern at the site with respect to the CDA?
- What are the disposal facility requirements to classify the materials excavated from the CDA under RCRA and TSCA regulations?

- Has the full extent of contaminated soil been removed from the CDA or is further excavation required such that no soils with concentrations greater than the New Jersey Department of Environmental Protection (NJDEP) Impact to Groundwater Soil Cleanup Criteria (IGWSCC) and USEPA ROD criteria remain at the site?

3.0 Identify the Inputs to the Decision

The following inputs are required to answer the fundamental questions identified in Step 2 above:

- Review existing data, if any, for the CDA. This includes analytical data as well as past practice and process history.
- Determine the appropriate analytical methods, keeping in mind that the methods must meet the sensitivities of the applicable regulatory limits and remediation goals.
- Collect soil samples to fully characterize the soils such that the offsite disposal facilities are satisfied.
- Collect soil samples following excavation to demonstrate that soils left behind are not hazardous to human health or the environment.

4.0 Define the Boundaries of the Study

The physical boundaries of the investigation have been defined as the CDA. These activities are currently planned to commence in October 2007.

5.0 Develop a Decision Rule

The purpose of this step is to integrate the outputs from the previous steps into a statement that defines the conditions that would cause the decision makers to choose among alternative actions. The following primary decision rules will be used to answer the fundamental questions:

- Waste characterization sample results will be compared against the 40CFR261 *Characteristics of Hazardous Waste* and 40CFR761 *PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions* to determine the disposal requirements. Any debris or soils containing concentrations of total PCBs greater than the regulatory standards (i.e., total PCB concentration

greater than 50mg/Kg) and dioxin concentrations less than 1ppm will be disposed of as PCB remediation waste.

- Final verification soil samples will be compared against the NJDEP IGWSCC and against the USEPA ROD (September 2004) cleanup criteria of 5ppb toxic equivalents (TEQ) for dioxins and dibenzofurans. If any concentrations greater than the cleanup criteria are detected, additional excavations will be conducted until all concentrations of the contaminants of concern are less than the cleanup criteria.

6.0 Specify Limits on Decision Errors

This step is to specify the decision maker's acceptable limits on decision errors, which are used to establish appropriate performance goals for limiting uncertainty in environmental data. These acceptable limits on decision errors allow decision makers to generate effective sampling designs while limiting uncertainties in the collected data.

There are two types of decision errors applicable to estimating the true value of a population: 1) sampling design error, which occurs when the sampling design is unable to capture the complete state of natural variability over space and time; and 2) measurement error, which refers to a combination of random and systematic errors. The combination of sampling design error and measurement error is termed as the total study error. Since it is impossible to eliminate error in measurement data, two types of decision errors can occur: Type I and Type II. A Type I or false positive error occurs when a null hypothesis is true, but is mistakenly rejected. A Type II or false negative error occurs when a null hypothesis is false, but is not rejected.

In this investigation, the false rejection error is concluding that soils do not contain contaminants of concern with concentrations exceeding the action levels when there are actually contaminants of concern with concentrations that exceeded the action levels. The false acceptance error is concluding that the soils do contain contaminants of concern with concentrations that exceeded the action levels when there are actually no contaminants of concern with concentrations that exceeded the action levels.

The consequences of the false acceptance decision will be unnecessary expenditure of resources such as funding, personnel, and time. The consequence of the false rejection error is that contaminants of concern in soils will not be remediated and will pose unacceptable risk to the environment or human health. Because of the possible severity of the false rejection error consequence, the false acceptance error is

more tolerable than the false rejection error. The false acceptance decision error will occur when the analytical results are biased high and the false rejection decision error will occur when the analytical results are biased low.

7.0 Optimize the Design for Obtaining Data

This step involves identifying the most resource effective sampling and analysis design for generating data that are expected to satisfy project DQOs.

The consequence of the decision error will need to be balanced against the cost of limiting the possibility of these errors. These errors will be managed by the use of precise and accurate analytical methods, sampling techniques (e.g., compositing for waste characterization), and duplicate sample analysis. To minimize unacceptable errors, laboratory analyses with a high degree of confidence and extensive quality assurance and quality control (QA/QC) and documentation procedures will be utilized.